shafts will have to be re-lined before production on any reasonable scale of output can be commenced. It cannot be hoped to do this in less than five years.

The Peace Treaty provides that due diligence shall be exercised in the restoration of these mines, but that Germany shall make up any deficiency in French coal output from these areas for ten years, the quantity to be thus delivered not to exceed 20 million tons annually for the first five years, and 8 million tons annually for the next five years. Furthermore, Germany is to supply France with 7 million tons a year for ten years, 4½ to 8½ million tons yearly to Italy, and a certain quantity also to Luxembourg. At the most, however, Germany will not have to provide more than about 32 to 35 million tons a year, or about one-fifth of the output left after the Sarre basin has been handed over. The price to be paid for this coal is to be the German pithead price, provided that such price does not exceed the British pithead price for export coal. Thus, incidentally, the Sankey award has had the result of enabling the Germans to charge our Allies 4*s*. 6*d*. per ton more for coal than they would otherwise have been able to do.

It is possible that Germany may lose a certain amount of her Silesian coal to Poland, but it seems clear that at the worst Germany will retain more than two-thirds of her coal reserves, and, as these were originally about two and a half times our own reserves, and more than half the total coal of all Europe, she is not seriously weakened in this respect, although France is undoubtedly strengthened.

No other minerals are specified in the Peace Treaty, but it is well known that the restoration to France of Alsace and Lorraine will have a profound effect in many respects. First of all France re-enters into possession of the whole of the Lorraine iron-ore fields; the vast deposit of "minette" thus becomes wholly French, with the exception of a small amount within the frontiers of Luxembourg, and, now that the latter country ceases to form part of the German Zollverein, it may be hoped that this ore will be diverted to Belgium, where it ought to go. Before the war Germany produced from the conquered province of Lorraine about 21 million tons of iron ore, or about three-fourths of its total output, so that the loss of Lorraine is for Germany an extremely serious matter. On the other hand, France is tolerably rich in iron ores, and the additional quantity of which she resumes possession will not matter to her very much, except for the fact that she can dispose of her surplus to other nations. Above all, the cardinal fact, which makes for world-peace more than would a dozen Leagues of Nations, is that Germany has no longer the iron-ore supplies with which to manufacture the immense stores of munitions which she would need if she were to commence the next war of which a certain section of Germans is already talking.

Another important point, equally well known, is that, with the rich potash deposits of Alsace in French hands, the German potash monopoly is broken, and the rest of the world is no longer bound to come to her for that important product. Thus it may be said that Germany has lost a large slice of her mineral assets; to maintain her position will need all the industry of her hard-working population, and it is more than ever clear to-day, with the Peace Treaty before us, that the future belongs to that nation which chooses to put in most real, steady, hard work for the next ten years.

H. L.

NOTES.

WE announce with profound regret that Lord Rayleigh, whose achievements in many fields of scientific research are familiar to all men of science, and esteemed throughout the world, died on June 30 at seventy-six years of age.

WE record with devout gratitude that the Treaty of Peace between the Allied and Associated Powers and Germany was signed at Versailles on Saturday last, June 28, thus bringing to a close a struggle in which the leading nations of the civilised world have been engaged for a period of nearly five years. The German delegates, in a statement to the Press, declare that they have signed the Treaty without any reservations whatsoever and in the honest intention of carrying out its provisions. They hope, however, that the Entente may in time modify some of the conditions. The return of peace has given rise to great rejoicing throughout the United Kingdom, and in the following message the King expresses the feeling of the people:—"The signing of the Treaty of Peace will be received with deep thankfulness throughout the British Empire. This formal act brings to its concluding stages the terrible war which has devastated Europe and distracted the world. It manifests the victory of the ideals of freedom and liberty, for which we have made untold sacrifices. I share my people's joy and thanksgiving, and earnestly pray that the coming years of peace may bring to them ever-increasing happiness and prosperity." Sunday next has been appointed by Royal proclamation as the day of general thanksgiving, and Saturday, July 19, will be devoted to national rejoicings.

FOLLOWING quickly on the Atlantic flight by heavier-than-air machines, a Service venture, under the control of the Air Ministry, is being made by R34, a machine lighter than air. This airship left East Fortune, Scotland, for Long Island, New York, in the early hours of Wednesday morning, with six officers and 20 N.C.O.'s and airmen, under the command of Major G. H. Scott, and also three officers travelling as passengers. The return journey was to be commenced in a few hours, after replenishing supplies. The distance to a destination near New York is approximately 3000 nautical miles. There will be no attempt to follow a direct route, but the airship will be navigated to secure the best weather conditions and to avoid unfavourable conditions. If the weather proves unfavourable to a westerly crossing, the ship will return to her base in the British Isles. There is a meteorological officer on board who will chart information received by wireless through the Air Ministry. An interesting discussion of the geostrophic winds or gradient winds for June, which give the air-flow practically at about 1000 ft. elevation over parts of the North Atlantic, has been made by the Meteorological Office. At 50° N. and 25° W. daily observations for twenty-eight years in June show that westerly and south-westerly winds greatly predominate, whilst easterly winds are rare. Similar conditions are shown in 50° N. and 40° W., but north-westerly winds are more frequent than further to the eastward. Wireless reports for several days past published by the Meteorological Office show a great amount of northerly wind, moderate to strong in force, ranging from 10 to 30 nautical miles an hour, and fair weather with a good deal of cloud over the eastern portion of the North Atlantic. Probably better progress would be made in proximity to the 40th parallel than by following the Great Circle track, as lighter head-winds would be experienced on the outward passage.

On the motion for the third reading of the Dogs Protection Bill in the House of Commons on June 27, its rejection was moved by Sir Watson Cheyne and seconded by Sir Philip Magnus. The ground on which this amendment was based was the "unnecessary and vexatious obstacle to medical research" that would be imposed by it, the delay involved in additional certificates being frequently a matter of great importance. The Minister of Health (Dr. Addison) concurred in this view, and pointed out that there was no breach of faith on the part of the Government in reconsidering its amendment passed at the Report stage. He held that Parliament had no right to stop or needlessly to embarrass such research work as that on rickets. The Bill was rejected, the voting being 62 for the third reading, 101 against.

Sir Norman Lockyer has been elected an associate of the Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique in the section of mathematical and physical sciences.

The death is announced, on June 27, of Dr. R. Dancer Purefoy, past president of the Royal College of Surgeons, Ireland, and a member of the Royal Irish Academy and the Royal Dublin Society.

Sir John Tweedy has been asked to deliver the first Thomas Vicary lecture (on anatomy and surgery, instituted by the Barbers' Company) to the Royal College of Surgeons of England. Prof. Elliot Smith and Dr. F. Wood Jones have been appointed by the college Arris and Gale lecturers.

The death is announced, on July 1, in his seventy-eighth year, of Sir John T. Brunner, Bart., the well-known chemical manufacturer, who was associated with the late Dr. Ludwig Mond in the foundation of the alkali works of Brunner, Mond, and Co. around Northwich, which are now among the largest of their kind in the world.

A series of earthquake shocks caused much injury and loss of life in the districts of Florence and Bologna on June 29. The Exchange Telegraph Co. reports that the Ximenian Observatory at Florence has been greatly damaged; and Father G. Alfani, director of the observatory, states that the shocks are the worst which have been experienced in Italy since 1895.

It is announced in *Science* that the seismological library of Count F. de Montessus de Ballore, director of the Seismological Service of Chile, has recently been purchased by Dr. J. C. Branner and presented to Stanford University. This is probably one of the most complete collections of seismological literature in existence, and it is accompanied by a manuscript catalogue containing nearly 5000 titles.

The council of the Royal Society of Arts has awarded the society's silver medal for the following papers read before the society during the past session:—E. C. de Segundo, The Removal of the Residual Fibres from Cotton-seed, and their Value for Non-textile Purposes; Sir Frank Heath, The Government and the Organisation of Scientific Research; W. L. Lorkin, Electric Welding and its Applications; W N. Boase, Flax: Cultivation, Preparation, Spinning, and Weaving; Lord Montagu of Beaulieu, Aviation as affecting India; and Prof. J. C. McLennan, Science and Industry in Canada.

The Imperial War Conference, after considering the report of a committee of which Sir James Stevenson, Bart., was chairman, made a recommendation in favour of the constitution of an Imperial Mineral Resources Bureau. This body has now been set up and charged with the duties of collecting information regarding the mineral resources and metal requirements of the Empire, and of advising the various Governments and others concerned from time to time what action might appear to be desirable to enable those resources to be developed and made available to meet the requirements of the Empire. The Governors of the Bureau have been appointed, one by the Home Government (the representative of which is the chairman of the Bureau), one by each of the five self-governing Dominions, one each by the Government of India and the Secretary of State for the Colonies, with six representatives of the mineral, mining, and metal industries appointed by the Minister of Reconstruction after consultation with the principal institutes and institutions representing those industries. The Governors have now received their charter of incorporation, and are engaged in putting into effect their scheme of organisation In order that the Bureau may be able successfully to discharge its functions and issue information of an up-to-date character, the Governors are seeking the closest co-operation and assistance of the various Government Departments, scientific institutions, societies, and other bodies with which the Bureau hopes to be associated. The offices of the Bureau are at 14 Great Smith Street, Westminster, S.W.1, and all communications should be addressed to the secretary.

A reprint has recently been issued in booklet form of the article entitled "Patent Law and the Legal Standard of Novelty," first published in the *Engineer* for April 11 last. "Historicus," the author of the article, directs attention to the fact that it was owing to a blunder committed by the Courts in the eighteenth century that the legal standard of novelty was raised from that of the practice of the art to that of absolute novelty within the realm. To this blunder has it been due that upon the shoulders of the inventor has been placed an onus of proof which he is to-day unable to bear. The subject is considered under the following headings:—(1) Is the legal standard of novelty a practicable one from an administrative point of view, or reasonable from the economic one? (2) To what extent can relief be granted from the legal requirement? (3) What modifications would it necessitate in the law and practice of letters patent? The opinion is expressed by "Historicus" that an official examination which would satisfy legal requirements is an administrative impossibility, and, further, that relief from the unduly high standard of novelty prevailing to-day is the primary need of the inventor. Such relief could, it is pointed out, be readily afforded him if the law and practice of letters patent were founded on the assumption that the applicant for protection intended "to make good" at the earliest opportunity. If this view found acceptance, the situation could be met by the institution of a preliminary examination limited in nature and extent, but sufficient in character to enable the inventor to approach the capitalist in the first instance with a broad claim for his invention, the title to which could be assured later by carrying out the manufacture of the invention within the realm.

THE controversy on the subject of mother-right which has arisen between Dr. E. Sidney Hartland and some American anthropologists is continued by Mr. R. H. Lowe in the University of California Publications on American Archæology and Ethnology (vol. xvi., No. 2). Dr. Hartland advanced two propositions: first, that normally, and apart from a few exceptions that seem well established, kinship was originally reckoned on one side only; secondly, that descent through the mother regularly preceded descent through the father. The objection raised to the first dogma is that almost uniformly the lowest tribes lack the unilateral mode of reckoning kinship. The second proposition is vigorously contested: the development of patrilinear out of matrilinear descent is denied as ignoring two vital groups of empirical phenomena—the frequent absence of the supposed symptoms among undoubtedly matrilinear peoples, and the enormous extent of borrowing. The matter is still *sub judice*, but the discussion, which is full of interest, may be commended to the notice of all students of sociology.

IN the University of California Publications in American Archæology and Ethnology (vol. xiv., No. 4) Mr. S. A. Barrett gives an elaborate account of a series of rites performed by the Wintun Indians, who formerly occupied a territory lying between the Sacramento River and the crest of the coast range of California. Their culture seems more closely related to that of the Pomo, adjacent on the west, than to that of the Maidu, who are separated from them by their own south-eastern kinsmen. The object of all their ceremonies, but especially that of the Toto and the Hesi, is, primarily, by a series of dances and dramatic performances, to ensure plentiful wild harvests, and, secondarily, to secure the health and general prosperity of the people. The performance of the Toto is believed to assure an abundance of green foods, such as Indian potatoes, by which is meant Brodicea, Calochortus, and their bulbs, as well as the plants the foliage of which is eaten. The Hesi is thought to produce ripe foods in plenty: grass seeds, manzanita berries, and especially acorns.

IN *Mind* (N.S. 110, April) Mr. H. S. Shelton discusses the syllogism and other logical forms. His aim is to define more clearly than is usually done in textbooks the exact sphere of logic, and to distinguish elements in it which, being of a metaphysical type, are misleading in logical argument. He maintains that in making any deduction three processes are involved:—(*a*) The abstracting from reality the concepts of the aspect with which we are dealing, (*b*) reasoning with regard to these concepts by means of some universal rule, and (*c*) the reference back again to reality of our conclusion. It is only when this last has been completed that we can be sure that our conclusion is materially true. He emphasises strongly that the sphere of deductive reasoning is not the sphere of empirical reality, and so logical conclusions require empirical verification. This view must not, however, be taken to imply that there is no sphere for formal logic; on the contrary, by defining more clearly what it cannot do, we are able to recognise what it can do. It is argued that the fundamental form of deductive reasoning is the syllogism, and that there is a sense in which all deductive reasoning, whether the rough and ready product of ordinary life or the more exact deductions of mathematical science, is and must be formal. In everyday life and ordinary arguments the various elements are so entangled as to obscure the essential characteristics of reasoning, and it is the function of logic to emphasise those aspects likely to be overlooked. The article should prove interesting both to men of science and to logicians.

AN artificial lava-flow, in places 6 ft. thick, was recently formed at a bottle factory in Kinghorn, Fife, by the corrosion of the floor of a tank through the solvent action of the glass. Seventy tons of "metal" were thus liberated, taking five days to cool, and developing, either directly or by contact-action with bricks, an interesting series of rock-forming minerals. The products have been carefully studied by Mr. G. V. Wilson from a petrographic point of view (Journ. Soc. Glass Technology, vol. ii., p. 177, 1918; see also NATURE, May 16, 1918, vol. ci., p. 217). Corundum occurs as a contact-product with bricks rich in alumina, and sillimanite, similarly developed, proves valuable as a protective lining on the bricks, as was pointed out in the discussion following the paper. Oligoclase arose in the absorption-zone between the bricks and the attacking glass, and small bipyramidal crystals of quartz, like those of many rhyolites, separated out in a portion of the glass that was stained violet by manganese and injected into the bricks after the main greenish glass. It is hence inferred that these later injections consolidated below 870°, and questions of temperature are critically considered throughout the paper. Tridymite and wollastonite were the only minerals developed in the general body of the glass, which is held, on account of the absence of pseudo-wollastonite, to have been at no time at a higher temperature than 1200°.

IN Professional Paper No. 17 of the Survey of India, Col. Sir S. G. Burrard makes an important contribution to the theory of isostatic compensation of inequalities in the earth's crust. Hayford in 1909 showed that in the United States this compensation is generally complete, and uniformly distributed in depth down to a uniform depth of about 110 km. But measurements of gravity in the outer Himalayas and in the adjacent alluvial plains of the Gangetic trough have hitherto been regarded as incompatible with the theory of isostasy. One suggestion which has been made to account for this is that in India the geological upheavals have taken place too recently to allow the compensation to be perfected as yet, but the anomalies in gravity seemed to correspond with over-compensation. Sir S. G. Burrard discusses this and other recent views on the subject preparatory to describing his own investigation, in which the novel point is that the excesses and deficiencies of density occurring in the different geological formations of the region are taken into account. In the past the theory of isostasy has been applied only topographically to the excesses and deficiencies of mass visible as mountains and oceans at the earth's surface; the density of the geological formation has not been considered hitherto because the depth to which any particular rock extends is frequently undetermined, so that its total volume and mass are unknown. Sir S. G. Burrard estimates the average depth and width of the Gangetic trough across six different sections, and adopts mean values of the density of the light rock deposits in the trough, including those into which, at no considerable depth, the alluvium is compacted by pressure. The crustal attenuation in the trough, assumed compensated for by denser rocks beneath, according to the isostatic theory, is shown to produce negative anomalies of gravity over the trough, and positive anomalies on either side of it; these are, in fact, the discrepancies which required explanation. After showing the agreement of the theory with the Himalayan and Gangetic observations, Sir S. G. Burrard similarly discusses the data for other great Indian troughs, and finds further confirmation of the existence of isostasy.

THE Geophysical Journal of the Meteorological Office, or the British meteorological and magnetic year-book, for 1917, recently received, gives daily values of the several elements observed in the British Isles. Data are dealt with for solar radiation, meteorology, atmospheric electricity, terrestrial magnetism, and seismology. Results for the upper air are given for certain stations situated in different parts of the United Kingdom, and nephoscope observations are made at Aberdeen, together with tables showing the occurrences of aurora. The hours of bright sunshine are given for several stations and the percentage of the possible duration; the normal values for some stations are for thirty-five years. Meteorological results comprise pressure, temperature, wind direction and velocity, and precipitation; the values are taken from self-recording instruments. Estimation is made of the cloud amount and the weather. Magnetic data are given for the observatories at Kew and Eskdalemuir (Dumfriesshire). Earth temperatures and the mean level of underground water are given for each day at Kew Observatory. Referring to the anemographs and to the wind factor derived from the revolution of the cups of the anemometers, it is noted that "recent investigations have shown that the correct factor depends on the speed."

A NOTE from the Nela Research Laboratory which appears in the February issue of the Journal of the Franklin Institute deals with the observations of Mr. M. Luckiesh on the influence of temperature on the transmission of a number of commercial coloured glasses. In general, the transmission decreases as the temperature of the glass is raised from 30° C. to 350° C., and in some cases there is a slight change of colour of the light transmitted, which, from the table of results given by the author, appears to be towards the red end of the spectrum. For medium red glass coloured by copper the transmission at 350° C. is 84 per cent. of that at 30° C., for deep red copper glass 42 per cent., and for blue-green copper glass 82 per cent. For pink gold glass, purple manganese, and dull yellow glass it is 90 per cent. or more, while for lemon-yellow glass it is 71 per cent. The cobalt glasses transmit well, deep violet showing no diminution at 350° C., while light blue transmits at 350° C., 8 per cent. more than at 30° C. For a yellowish-green chromium glass the transmission is 67 per cent. only.

MR. HARRY J. POWELL's paper on glass-making before and during the war, recently read before the Royal Society of Arts, is a valuable summary of the achievements of the British glass trade in the very trying conditions of war. Many new types of manufacture were undertaken by individual firms, and especially in the field opened up by the war, which deprived this country of the different classes of scientific glassware obtained prior to 1914 from Germany. Thanks to assistance from Sir Herbert Jackson and the Institute of Chemistry (who supplied recipes of certain German glasses), this particular branch of the industry has obtained a good start in the direction of rendering our country independent of German supplies in future. The author, however, warned his listeners that Germany (and especially Jena) have probably made progress as well during the war. It therefore behoves British science and the glass industry to cooperate more clearly than in the past; and no doubt the new Institute of Glass Technology at Sheffield University will contribute in no small measure to the attainment of this object.

LICHTENBERG's dust figures caused by an electric spark were observed for the first time in 1777. Since then they have formed the subject of a long series of investigations. P. O. Pedersen has recently published in English the first part of a detailed examination of the subject (*Det Kgl. Danske Videnskabernes Selskab, Mathematisk-fysiske Meddelelser*, i., 11). In order to obtain pure and simple figures the Lichtenberg gap must be subjected to a very high impulsive voltage of very short duration. The size, shape, and character of the figures are independent of the nature of the plate and the mechanical and physical condition of its surface. They are controlled almost exclusively by the nature and pressure of the surrounding gas. The difference between the positive and negative figures is very striking. The pure negative figure appears as a white disc broken up into separate parts by a number of fine dark radial lines. It is attributed to ionisation by collision produced by electrons moving outwards from the electrode. The positive figures consist of sharply defined stems or trunks with short, well-defined branches or offshoots. It is suggested tentatively that they are due to positive particles moving outwards from the electrode. One difficulty in the way of this view is the fact that the velocity with which the positive figure spreads out from the electrode is two or three times greater than the corresponding velocity for the negative figure. The results already obtained seem to indicate that the elucidation of the formation of the figures will prove of considerable theoretical importance.

ALTHOUGH surveying by means of photography is a comparatively old art, and was actually employed more than twenty-five years ago for mapping some 25,000 square miles in America under conditions that rendered surveying by the usual method quite impossible, it is the recent war that has brought it into prominence, and done more than any other circumstance to demonstrate its advantages. Moreover, the recent methods are new so far as they allow the use of a very high viewpoint, and also the vertical position of the camera, which brings the sensitive plate parallel to the ground, instead of, as is usual, perpendicular to it. New conditions and new desiderata have led to the designing of new forms of cameras, and these we referred to a few weeks ago. But these new conditions have given rise to new problems, many of which were solved during the war, but for obvious reasons are only now getting published. In the *British Journal of Photography* for May 30 there appears a small series of articles on "Calculations in Aerial Photography," by M. L. P. Clerc, the results of which were empoyed by the French Aerial Photographic Service. In these M. Clerc considers "the lowering of the horizon line in photographs taken from high view-points," and gives a diagram which shows the extent of the lowering in mm. for various heights and various focal lengths of the objective. "The estimation of the height of objects by the measurement of their cast shadows in aerial photography" is also accompanied by a chart, in which a series of curves gives the height sought under the various conditions that affect the shadow. "The limit of admissible angling in vertical or horizontal photography" is, as in the other cases, worked out mathematically, and the results expressed in curves on charts for convenience in practice.

THE governing body of the College of Science, University of Calcutta, has expressed a desire that the researches undertaken in the various departments of the college should be published from time to time in the form of memoirs or bulletins. Through the courtesy of Sir Prafulla Chandra Rây, we have received a copy of the first of these memoirs issued by the department of chemistry; it is a volume devoted to the organic thio-compounds. Some of the papers have already appeared in a condensed form in the Journal of the Chemical Society; these have been incorporated with additional matter so as to present a connected account of the thio-compounds which give rise to tautomeric changes and to the formation of polysulphonium derivatives. The author remarks that time alone can show whether there will be a continuity in the regular issue of such memoirs, and warns those who intend to pursue chemistry in India that they must not expect to reap a rich harvest in the near future. For a thousand years or more India has been a *tabula rasa* so far as the cultivation of the physical sciences is concerned. "We in the East have been living in silent and ecstatic meditation." Pioneers in the introduction of Western science have no native tradition to follow up: they must formulate their own schemes and carry them out as best they may. At the same time, the work already turned out by some of the pupils is full of hopeful augury for the future.

MESSRS. DULAU AND CO., LTD. (34 Margaret Street, W.1), are offering for sale (in Catalogue No. 76) some nine hundred works in geology and palæontology, entomology, botany and agriculture, geography and travel. The list contains several scarce items, and long runs of scientific serials, but for the most part it deals with volumes of current interest and value, and the prices asked are most moderate. The catalogue should be seen by anyone wishing to form or add to a science library.

A NOTEWORTHY feature of the latest catalogue (No. 180) of Messrs. W. Heffer and Sons, Ltd., Cambridge, is the Oriental library of the late Dr. A. F. R. Hoernle, of Oxford, comprising more than four hundred items (the Sanskrit portion of the library is not included, being promised for a later catalogue). Other works offered for sale by Messrs. Heffer deal with folk-lore, mythology, and allied subjects; there is also a list of recent purchases in science books, many of which are publications issued abroad. The catalogue is sent free by the publishers upon application.

MR. J. Y. BUCHANAN, F.R.S., is publishing through the *Cambridge University Press* a volume entitled "Accounts Rendered of Work Done and Things Seen." It will comprise some thirty-three papers, mostly dealing with scientific subjects. Among them are several from our columns. Others are "Geography, in its Physical and Economical Relations"; "A Retrospect of Oceanography in the Twenty Years before 1895"; "On a Method of Determining the Specific Gravity of Soluble Salts by Displacement in their own Mother-liquor, and its Application in the Case of Alkaline Halides"; "On the Oxidation of Ferrous Salts"; "Lakes," and "On the Compressibility of Solids." The essays will be printed in their original form. *Messrs. H. K. Lewis and Co., Ltd.*, will shortly issue to subscribers "Sir William Osler's Anniversary Book," which is now in course of preparation by Sir W. Osler's pupils and colleagues numbering about a hundred.

OUR ASTRONOMICAL COLUMN.

NOVA AQUILÆ.—This temporary star, which appeared last year, is slowly pursuing its course of decreasing brightness, and is now about magnitude 6½ or fainter. Observations by Mr. Harold Thomson, in the Journal of the British Astronomical Association for May, give 6·14 as the magnitude on March 28, 6·14 on April 26, 6·37 (the mean of observations with two instruments) on May 22, and 6·64 on May 26. These magnitudes are determined by comparison with the neighbouring star B.D.+0° 4027, the magnitude of which is taken as 6·04. Mr. Thomson adds that the visual spectrum strongly resembles that of Nova Geminorum II. at a similar stage of its career. The continuous spectrum is still visible from about the position of the D line to near Hγ. The brilliance of the nebula line at 5007 is intense. There is at least one bright line remaining of the group near D, which was so conspicuous in the early stages, and bright lines or bands are still visible near 464 and Hγ.

THE PARALLAX OF THE ORION NEBULA.—The distance of this well-known nebula, or rather of the stars associated with it, has been determined both by Prof. Kapteyn and Prof. W. H. Pickering with considerable divergence in its amount. In both cases the results were deduced by a method which is practically comparing the brightness of the stars in question with the brightness of stars of the same types the distances of which are assumed to be known. Prof. Pickering obtained the value 0·0005″, whilst Prof. Kapteyn found 0·0054″. In the April issue of Publications Ast. Soc. Pac. Prof. Pickering attempts to explain this wide discordance by the fact that the same stars of the nebula formation were not used in the two investigations, and that the type of spectrum assigned, and therefore luminosity, were different. He now accepts 0·0020″ as the value of the parallax, and considers this to be a maximum value.

PLANETARY NEBULÆ.—The 60-in. reflector of the Mount Wilson Observatory is being used by Mr. van Maanen for the determination of stellar parallaxes photographically by the usual method relative to comparison stars. Mr. van Maanen is specially finding the parallaxes of nebulæ, and the distances of six of the planetary class have lately been published (communication to the National Academy of Science, No. 56, reprint). The absolute parallaxes of the central stars range from 0·008″ to 0·023″, and, the photographic magnitudes having been derived, it is possible to determine the absolute magnitudes, the mean of which for the six nebulæ is +9·1. This faint absolute magnitude is noteworthy because the spectra of these objects consist in many cases of bright lines, whereas with the stars in general bright-line spectra are usually associated with high luminosities, some Wolf-Rayet stars, for instance, the spectra of which resemble those of planetary nebulæ in some respects, having been found to have a mean absolute magnitude not far from 0. The linear dimensions of these objects can obviously be found from their measured angular diameters, and the major axis of the largest of the six, N.G.C. 6720, is given by Mr. van Maanen as 10,000 astronomical units, and the smallest, N.G.C. 7662, as 1350 units, which may be compared with the orbit of Neptune, the diameter of which is 60 astronomical units. It is to be noted that in the new General Catalogue these six objects are not described as planetary in every case, the two above-mentioned being in the annular class.